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P01/7700 0.00-0322711.3

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Cardiff Road
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1. Your reference — RL.P52857GB

2. Patent application number *(The Patent Office will fill in this part)* — 0322711.3 — 27 SEP 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

   Telefonaktiebolaget LM Ericsson (Publ)
   SE-12625
   Stockholm
   Sweden

   Patents ADP number *(if you know it)* 06917440001

   If the applicant is a corporate body, give the country/state of its incorporation — Sweden

4. Title of the invention — Intelligent Multimedia Calls

5. Name of your agent *(if you have one)* — Marks & Clerk

   "Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

   4220 Nash Court
   Oxford Business Park South
   Oxford OX4 2RU
   United Kingdom

   Patents ADP number *(if you know it)* — 7271125001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

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   b) there is an inventor who is not named as an applicant, or
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Continuation sheets of this form	
Description	5
Claim(s)	1
Abstract	1
Drawing(s)	3 + 3

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature Marks & Clerk Date 26 September 2003

Marks & Clerk

12. Name and daytime telephone number of person to contact in the United Kingdom: Dr. Robert Lind 01865-397900

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Intelligent Multimedia Calls

Field of the Invention

The present invention relates to the provision of intelligent multimedia calls and in particular, though not necessarily, to the provision of intelligent video calls.

Background to the Invention

There exists many services implemented in circuit switched (CS) network with the help of so-called Intelligent Network (IN) nodes. These services mainly utilize voice bearers in the CS network. The reason for this is that the devices which are utilized by services tend to support only pure voice only. There exists multimedia protocols which are however capable of utilizing the CS bearers, e.g ITU-T H.324. Currently there exists implementations which utilize these protocols for pure video telephony, e.g. User A calling to User B, which communicate with each other interactively.

Many IN services used for voice call provide for announcements and prompts to a calling subscriber to allow access to and selection of services by means of DTMF-digits. The narrowband multimedia protocol H.324 (*Terminal for low bit-rate multimedia communication*) uses an unrestricted 64kbit/s digital bearer in 3G-324M applications as seen by the IN-nodes. The content of the 64kbit/s bearer includes audio, video and control streams multiplexed using the H223 protocol (*Multiplex protocol for low bit rate multimedia communication).* The voice announcements played by IN-services are typically stored in PCM coding format. Since the prior art IN-solutions do not include the capability to manipulate the content of unrestricted 64kbit/s digital calls, IN services do not have the possibility to play announcements for 3G-324M calls.

3G-324M uses efficient audio codecs, e.g. AMR (advanced multi rate) and G.723. These codecs are not capable of transferring the DTMF tones reliably.

Thus the DTMF tones are transferred in H324 by means of control messages, i.e. H245 (*Control protocol for multimedia communication)* userInputIndication message. Since the prior art IN-solutions do not include the capability to detect the content of unrestricted 64kbit/s digital calls, IN services do not have the possibility to listen the DTMF tones for 3G-324M calls.

Summary of the Invention

Aspects of the present invention are defined in the attached claims.

Brief Description of the Drawings

Figure 1 illustrates an architecture for providing multimedia services to users;
Figure 2 illustrates a MG architecture of an IN node of the architecture of Figure 1;
Figure 3 illustrates an alternative architecture for providing multimedia services to users;
Figure 4 illustrates a MG architecture of a combined VSG/IN node of the architecture of Figure 1; and
Figure 5 illustrates a MGC architecture of a combined VSG/IN node of the architecture of Figure 1.

Detailed Description of Preferred Embodiments

The video gateway concept was introduced to make it possible to connect CS based multimedia services to the PS based multimedia services, i.e. enabling a video call from CS based terminal (H.324) to a PS based terminal (H.323 / SIP). This video gateway was referred to as the "video interactive gateway". Currently the video gateway is known to also contain video streaming gateway (VSG) capabilities enabling a CS based terminal to connect to PS based servers. In this case VSG interworks between for example ISUP + H.245 and RTSP (real time streaming protocol) on the control plane, and between TDM

and IP/RTP on the user plane.

Since this configuration uses normal CS bearers, e.g. 64kbit/s unrestricted and normal CS control protocols (ISUP), it can be easily integrated with IN-services as illustrated in Figure 1. This can happen as follows:

1) The IN services platform contains capabilities to route CS calls based on various parameters, e.g. calling party location and current time. This allows called party number modifications based on these parameters. Thus IN can forwards a CS call to the VSG on the basis of various called party numbers. The VSG maps these numbers to URLs, which represent different resources, e.g. video clips in streaming servers. This makes it possible to provide services such as the local weather forecast using video and audio (based on caller's location) media.

2) The IN services platform contains capabilities to create calls "out of the blue" to one party or to several parties. This may happen for example based on time, subscriber movements, etc. Thus the IN node can make a connection between the server subscriber and streaming server by the means described in 1). This makes it possible to provide push services such as wake-up calls providing business news, and advertisement videos when the served subscriber approaches a shop/restaurant.

The IN service logic receives information about the nature of a call, e.g. a 3G-324M call with the help of ISUP and INAP/CAP (intelligent network application part/ CAMEL application part) signalling. This information is used by the IN service logic to select video clips at a streaming server instead of voice announcements played by SSP/MG1. Thus VSG is seen by the IN as an intelligent peripheral (IP). The prior art IN implementation is enhanced with the H223 de-multiplexing and multiplexing function in MG1. The H248 protocol already includes packages to detect H.245 messages and pass information to the MG controller. This enables the IN service logic to receive DTMF digits received by H245 UII message in MG1. The received DTMF digits are used by the IN service to trigger appropriate actions in the service logic. This may

include routing the call to different destinations, e.g. to normal video telephones or video streaming servers.

These tools allow IN-technology to create services and service groups, which can be illustrated to a user with the help of visual information. For example the user can use the normal terminal keypad to change to another video clip/live video camera view whilst watching another vide clip. The first video clip may contain audio-visual instruction about the availability of the other video clips. The selection of the appropriate video is controlled by the IN-service by rerouting the call to another destination. This may involve usage of other service triggers, e.g calling party location (to select e.g. the nearest camera) or calling party id (to select e.g. the right language).

A detailed overview of the Media Gateway (MG) is shown in Figure 2.
Based on information about the call type, i.e. H324 in H248 Add and information that DTMF digit detection is requested, the controller links the H245 handlers and H223 multiplexers at the MG into the call, instead of linking the normal DTMF receiver.
H223 mux multiplexes the H324 user data stream between media streams and the H245 control stream.
H245 handler contains H245 decoder/encoder and statefull logic to control H245 signaling. i.e:

- When H245 userInputIndication (UII) containing the dialed digit is received from subscriber the digit is passed to H248. The mechanism to transfer detected digits in H248 is the same as for a normal voice call.
- H245 handler gathers data relevant for MG from the H245 signaling between end-points, e.g. H223 mux configuration data transferred in H245 MultiplexentrySend (MES) in order H223 must to use the same multiplexing algorithm as the end-points.
- Trigger and suppress H245 signaling when needed, e.g. if IN-services decides to reroute the call to a new destination, when media channels are open to old destination, H245 handler needs to close channels to the calling

party prior to opening channels between the new destination and the calling party.

One problem with the approach described above is that separated IN and VSG architectures may create delays, eg. H223 multiplexing in MG_1. This problem may be solved by combining the IN and VSG. This makes it possible for the IN to utilize the same resources and the same H223 demultiplexer as the VSG, which are anyway needed for VSG functions. This approach is illustrated in Figure 3.

A detailed overview of the MG is shown in Figure 4. The architecture is the same as in the normal MG of the VIG/VSG. H223 mux multiplexes the H324 user data stream between media streams and the H245 control stream. Multiplexing happens according to the configuration parameters received from MGC. Media streams are transferred to RTP handlers and further to IP network. H245 control stream including UII message is transferred via H248 to MGC. All this happens in the same way as in the normal VIG/VSG.

A detailed overview of the MGC is shown in Figure 5. The Controller contains logic to reroute the call based on the commands from SCP via INAP. This involves establishing a new RTSP session. Depending on the parameters on stream content (Session Descriptor Protocol, SDP), the controller may need to reopen the channels towards the calling party with new codec parameters with the help of the H245 handler and modify the codec parameters in the MG.

The architectures described here allow the IN and Internet streaming servers to be combined with the help of the VSG, to provide multimedia intelligence .

Claims

1. A method of delivering streaming data over a circuit-switched access network from a packet-switched streaming server to a mobile wireless terminal, the method comprising:

at an Intelligent Network node, selecting a telephone number allocated to a video gateway;

sending a call setup message from said Intelligent Network node to said telephone number and establishing a circuit switched connection between said terminal and the video gateway;

at the video gateway, identifying a packet-switched network address associated with said telephone number; and

receiving streaming data from said packet-switched network address, and forwarding the data to said terminal over said circuit-switched connection.

2. A method of setting up and/or controlling a multimedia call involving a user terminal and a circuit switched connection between the user terminal and a video gateway, the method comprising:

routing circuit switched related signalling to an Intelligent Network, IN, node, with user initiated DTMF signals being contained within H.245 messages; and

at the IN node, detecting H.245 messages containing DTMF signals, and causing the service logic at the IN node to set up and/or control the circuit switched connection to the video gateway in accordance with the received DTMF signals.

ABSTRACT

Intelligent Multimedia Calls

A method of delivering streaming data over a circuit-switched access network from a packet-switched streaming server to a mobile wireless terminal, the method comprising:

at an Intelligent Network node, selecting a telephone number allocated to a video gateway;

sending a call setup message from said Intelligent Network node to said telephone number and establishing a circuit switched connection between said terminal and the video gateway;

at the video gateway, identifying a packet-switched network address associated with said telephone number; and

receiving streaming data from said packet-switched network address, and forwarding the data to said terminal over said circuit-switched connection.

Figure 1

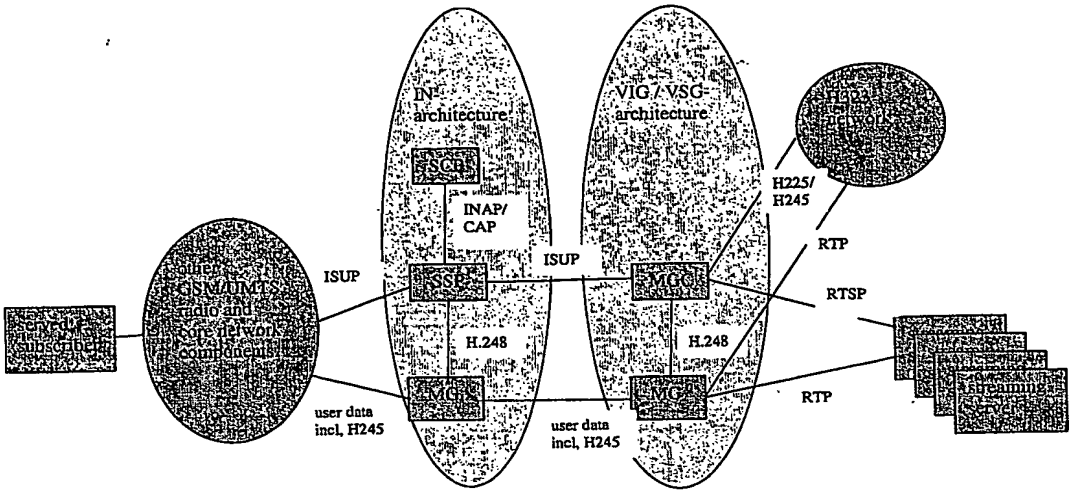

Figure 1

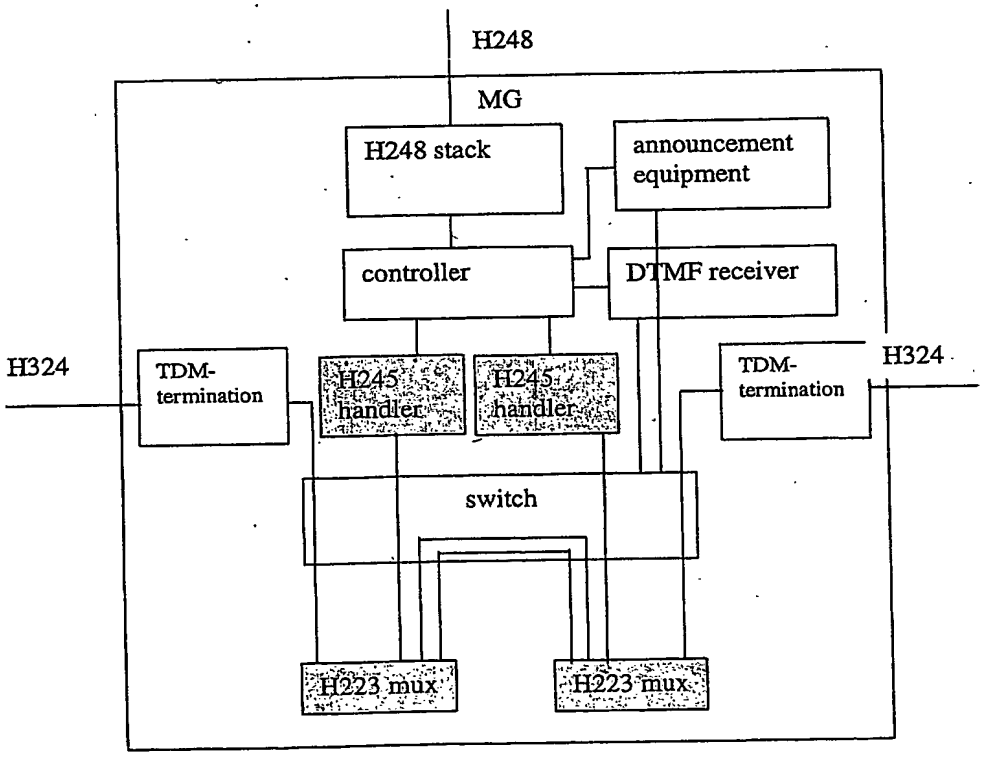

Figure 2

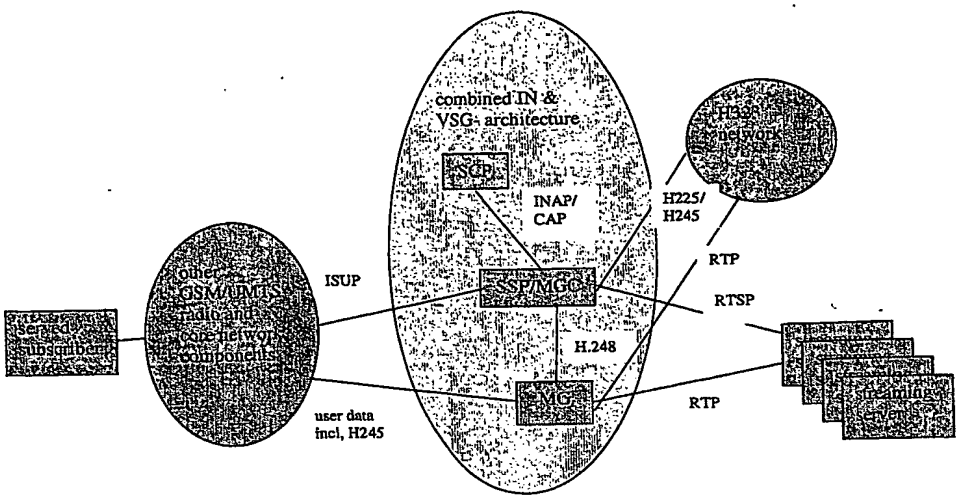

Figure 3

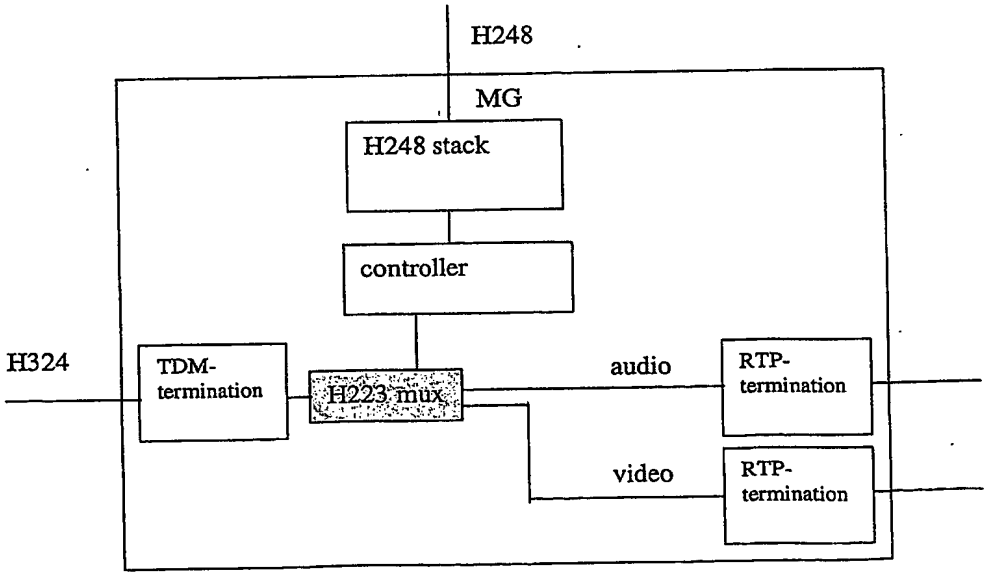

Figure 4

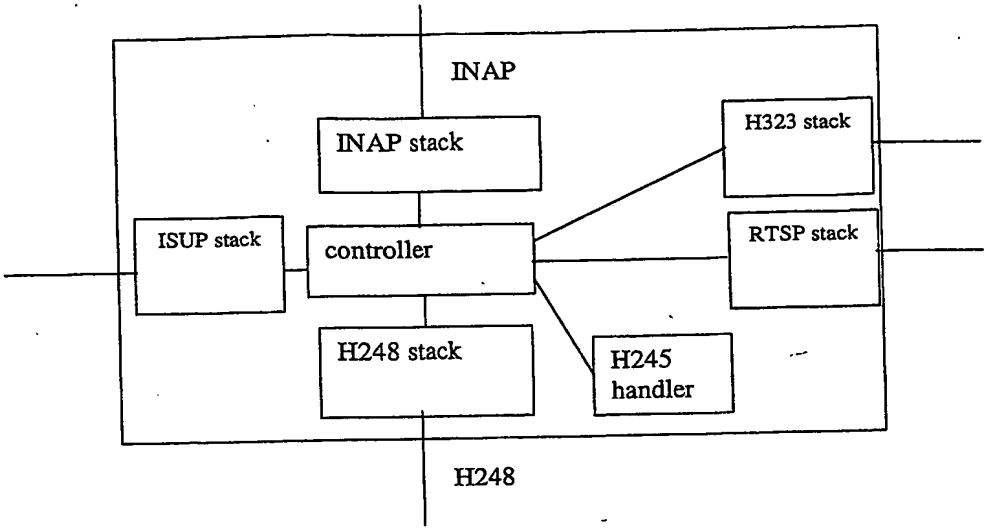
INAP
INAP stack
H323 stack
ISUP stack
controller
RTSP stack
H248 stack
H245
handler
H248

Figure 5

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